

REMARKS

Claims 1, 5, 11, 16, 19, 21, and 26-29 are now pending in the present application. Claims 1, 5 and 16 have been amended, claims 2-4, 6-10, 12-15, 17, 18, 20 and 22-25 have been canceled and claims 26-29 have been added. Claims 1 and 16 are independent. Reconsideration of this application, as amended, is respectfully requested.

Rejections Under 35 U.S.C. §§ 102 and 103

Claims 1, 10, 11, 14, 16, 19 and 21 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Machida et al., U.S. Application Publication No. 2002/0010539. Claims 1 and 16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hosaka, U.S. Patent No. 4,976,239 in view of Machida et al.. Claims 1-3, 5, 6, 10-14, 16-19 and 21-25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Iwamoto, U.S. Patent No. 5,230,318 in view of Machida et al.. Claims 11 and 21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hosaka in view of Machida et al. as applied to claims 1 and 16 above, and further in view of Iwamoto. These rejections respectfully traversed.

At the outset, it is respectfully pointed out that claims 2, 3, 6, 10, 12-14, 17, 18 and 22-25 have been canceled without prejudice to or disclaimer of the subject matter contained therein. Accordingly, the Examiner's rejections under 35 U.S.C. §§ 102 and 103 have been rendered moot with regard to these claims.

With regard to independent claim 1, this claim is directed to a fuel injection control system for an internal combustion engine, wherein a combination of elements are recited including "means for determining a fuel injection correction factor on the basis of the gear position and the engine speed NE" and "means for correcting the basic fuel injection quantity determined by the TH map on the basis of the gear correction factor."

With regard to independent claim 16, this claim is directed to a fuel injection method for an internal combustion engine, wherein a combination of elements are recited including "determining a fuel injection correction factor on the basis of the gear position and the engine speed" and "correcting the basic fuel injection quantity determined by the TH map on the basis of the gear correction factor." Applicants respectfully submit that the references relied on by the Examiner fail to teach or suggest the present invention as recited in independent claims 1 and 16.

It should be noted that the above amendments to independent claims 1 and 16 should overcome the Examiner's rejections under 35 U.S.C. § 102(e) in view of the Machida et al. reference and the Examiner's rejection under 35 U.S.C. § 103(a) in view of the Hosaka and Machida et al. references. Specifically, subject matter previously presented in dependent claims 2 and 17 of the present invention (claims 2 and 17 have been canceled) has been added to independent claims 1 and 16, respectively. Since the above rejections from the Examiner do not include previously presented claims 2 and 17, Applicants submit that these rejections from the Examiner have been rendered moot.

Accordingly, the following comments will be directed to the Examiner's rejection under 35 U.S.C. § 103(a) in view of the Iwamoto and Machida et al. references.

Referring to the Examiner's Office Action, the Examiner asserts that Iwamoto discloses all of the elements and the steps of independent claims 1 and 16, except for the TH map that is used to determine the basic fuel injection quantity. However, the Examiner relies on the Machida et al. reference to modify Iwamoto to arrive at the presently claimed invention. Applicants respectfully submit that the modification proposed by the Examiner would not have been obvious to one having ordinary skill in the art.

Referring to the Iwamoto reference, this reference discloses a fuel supply control apparatus for an internal combustion engine. However, the main object of this reference is to utilize the intake pipe pressure and not the throttle opening θ_{TH} to determine the basic fuel injection quantity. In view of this, the modification proposed by the Examiner to utilize the TH map of Machida et al., which utilizes engine speed NE and throttle opening θ_{TH} , would be contrary to the teachings of Iwamoto.

As can be understood from column 1, lines 10-35 of Iwamoto, the Iwamoto device is an improvement upon the conventional art that uses the speed of the engine and the intake pipe pressure to determine the fuel injection quantity. Specifically, this portion of Iwamoto states the following:

... For example, the decision as to whether or not the engine takes the high-load state is made on the basis of the degree of the pressure within the intake without using a throttle valve opening sensor. More specifically, a

decision level for deciding the high-load state is set on the basis of the speed of the engine so as to be compared with the intake pipe pressure so that the high-load is determined when the intake pipe pressure exceeds the decision level. (emphasis added).

In addition, referring to column 3, lines 30-34 of Iwamoto, it is stated that the ECU acts "as a high-load decision means to decide, on the basis of the detection signal of the pressure sensor 4 and the pressure decision value in accordance with an operation (which will be described hereinafter), whether the engine is in a high-load state." Furthermore, column 4, lines 45-63 of Iwamoto describe the calculating of the basic fuel injection quantity using the intake pipe pressure P and the engine speed N_e . In addition, column 5, lines 14-18 state "[a]ccordingly, as described above, the decision value PM_{th} is set on the basis of the vehicle speed SPD and the gear-shift position GEP , without using a throttle sensor, so as to be compared with the intake pipe pressure PM , thereby accurately performing the high-load decision. A review of the figures of Iwamoto and the claims will confirm that the main object of Iwamoto is to use the intake pipe pressure and the engine speed to determine the fuel injection quantity and not the throttle opening θ_{TH} .

Further to the above, referring to Figure 1 of Iwamoto, there is no throttle opening detector to determine the opening of the throttle valve 3. There is only a pressure sensor 4 that considers the intake pipe pressure. The intake pipe pressure is used to calculate that basic fuel injection quantity. Applicants submit that adding a throttle opening detector to the Iwamoto device (a throttle opening detector would be necessary to utilize the TH map

of Machida et al.) would be contrary to the teachings of Iwamoto, since Iwamoto specifically desires to determine the fuel injection quantity without the provision of a throttle opening detector. In view of this, the modification proposed by the Examiner is non-obvious.

In view of the above, the modification proposed by the Examiner is contrary to the teachings of Iwamoto and therefore non-obvious. In other words, one having ordinary skill in the art, taking into consideration the teachings of Iwamoto and Machida et al. as a whole, would not modify the Iwamoto reference in the manner suggested by the Examiner. Therefore, the Examiner's rejection is improper and should be withdrawn.

With regard to dependent claims 5, 11, 19 and 21, Applicants respectfully submit that these claims are allowable due to their respective dependence upon independent claims 1 and 16, as well as due to the additional recitations in these claims.

In view of the above amendments and remarks, Applicants respectfully submit that claims 1, 5, 11, 16, 19 and 21 clearly define the present invention over the references relied on by the Examiner. Accordingly, reconsideration and withdrawal of the Examiner's rejections under 35 U.S.C. §§ 102 and 103 are respectfully requested.

Additional Claims

Additional claims 26-29 have been added for the Examiner's consideration. Applicants respectfully submit that these claims are allowable due to their dependence

upon allowable independent claims 1 and 16, as well as due to the additional recitations in these claims.

Favorable consideration and allowance of additional claims 26-29 are respectfully requested.



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CONCLUSION

All the stated grounds of rejection have been properly traversed and/or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently pending rejections and that they be withdrawn.

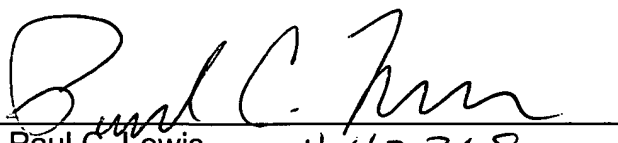
It is believed that a full and complete response has been made to the Office Action, and that as such, the Examiner is respectfully requested to send the application to Issue.

In the event there are any matters remaining in this application, the Examiner is invited to contact Paul C. Lewis, Registration No. 43,368 at (703) 205-8000 in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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